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U.S. ARMY CORPS OF ENGINEERS

DEFENSE MESSAGE SYSTEM-GOSIP

Implementation/Guidance Plan

U. S. Army Corps of Engineers

Directorate of Information Management

Policy & Architecture Division

Washington, DC

February 1996

PREFACE

The Defense Message System (DMS) will implement a global electronic mail system using commercial off-the-shelf products to conduct secure business-grade messaging throughout the Department of Defense. DMS will serve as a single, seamless system supporting administrative, command and control, intelligence, sustaining base and deployed forces.

This global architecture utilizes the X.400 messaging protocol with X.500 directory services and an encryption methodology based on the Fortezza crypto-card. DMS is elegant in its simplicity, yet sophisticated in services provided and there are a number of architectural foundations and terms that must be understood to fully comprehend the DMS vision.

This Implementation/Guidance Plan has been specifically created to provide much needed and valuable DMS information to all Corps members. Implementation and funding schedules presented in this guidance are subject to change based on events determined by the Army DMS PMO. Additional DMS information can be found on the Defense Information System Agency, WWW home page at (http://www.itsi.disa.mil/dmshome.html). I encourage its use!

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/s/
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U.S. Army Corps of Engineers

DMS-GOSIP

Implementation/Guidance Plan

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Section I

Program Summary

1.1 Introduction

The Defense Message System (DMS) Program, established by the Under Secretary of Defense (Acquisition), will facilitate and coordinate development of an integrated common-user message system that satisfies writer-to-reader requirements. The DMS will be used as a direct replacement for AUTODIN "Front Channel" messaging. It will also be used as a direct replacement for proprietary electronic mail (e-mail) messaging. All electronic messaging (AUTODIN and legacy electronic mail) within USACE will migrate to DMS-Compliant messaging as rapidly as possible upon guidance from the DoD/Army DMS Program Management Offices.

1.2 Rationale for Change

Change is mandated by the problems and costs of the current messaging systems, lack of an overall DoD messaging architecture, and the emergence of new international standards and technology. The current AUTODIN and DoD Internet electronic mail messaging systems are expensive and staffing intensive. Even with this high cost, they do not provide the required levels of user writer-to-reader service and security protection.

Previous efforts to improve DoD's messaging systems have met with limited success. This was due in large part to multiple, uncoordinated implementation strategies that have fostered maintenance of multiple DoD messaging technologies and have assumed that existing formats, procedures (to include manual operations) and interfaces between systems must continue. These old strategies resulted in a paralysis that promoted the continuation of "business as usual" and denied DoD-wide economic and user service benefits that can be realized with fewer technology and international standards.

Recently imposed DoD budget constraints, rapid advances in both messaging technology and international messaging standards, industry's movement to these standards, and recognized problems with the current systems, provide a strong impetus for change. By coupling improved technology and new standards with needed improvement in DoD's acquisition strategy, the DMS provides the opportunity to improve writer-to-reader service at lower cost and

staffing.

1.3 Project Objectives

The DMS program has three (3) primary objectives:

- reduce cost and staffing while maintaining the existing levels of service and security,
- provide automated systems to replace outdated semi-automated AUTODIN messaging systems,
- progress toward a total paperless organization/individual message service.

To achieve these objectives, the DMS Army Program will:

- implement an X.400 based Message Handling System (MHS) and X.500 based directory services incorporating Multi-Level Information Systems Security Initiatives (MISSI),
- incorporate Multiple Level Security (MLS) for X.400/X.500,
- phase out baseline messaging systems, i.e., AUTODIN and unprotected electronic mail systems,
- phase out baseline message formats and procedures (ACP 127, JANAP 128 AUTODIN message formats and procedures, Request for Comment (RFC) 822),
- maintain allied and tactical transitional gateways to support the differences in security services and messaging policies and procedures,
- develop capability, policy, and procedures to share DMS applications among users,
- extend DMS-Army Network System Management to classified individuals and organizational message service components.

The DMS-Army Program has evolved since 1988, from the Army Record Communication Modernization Program and will implement the Army's portion of the DMS and modernize message services within the Army. Under DMS, messaging capabilities and functions will be

transferred from centralized Telecommunications Centers (TCC) to the user's desktop. This process will reduce, with the goal to eventually eliminate, TCC staffing and its associated O&M costs.

No reduction in staffing within USACE is anticipated because of the relative small number of personnel (one or two), that currently operate Corps TCCs. It is anticipated that currently assigned personnel in the 37 TCCs will become the DMS Certificate Authority Workstation (CAW) operators. An explanation of CAW functions can be found in **Appendix A.**

1.4 System Capabilities

The DMS messaging, directory, security, and management systems will interoperate as a system to provide a messaging infrastructure to support a DoD user base of at least 2.0 million users. The design is scalable to support system growth and meet increased messaging requirements (e.g., increased numbers of users, increased message sizes, increased numbers of messages, etc). The following outlines basic system capability.

1.4.1 Connectivity/Interoperability

The system will allow users to communicate with messaging users within the DoD, including organizations and individuals, and interface to US Government, Allied, defense contractors, and other authorized users. Messages will be composed, delivered, and received at the user's desktop.

1.4.2 Guaranteed Delivery

The system will deliver all messages to the intended recipients with a high degree of certainty (i.e., approximately 100.00 percent guaranteed delivery with undetected message loss of less than one out of 100 million) and promptly notify the sender of non-delivery of any message. DMS will provide writer-to-reader message accountability.

1.4.3 Speed of Service

The system will operate/process from a synchronized (e.g., within 30 seconds) time standard based on the Coordinated Universal Time (ZULU time). It will support the speed-of-service requirements stated in the DMS Required Operational Messaging Capabilities (ROMC), and recognize messages that require preferential handling. The urgency of the most critical information will require handling above and beyond simple priority. The message system will automatically adjust to changing traffic loads and

conditions to provide timely delivery of critical information during peacetime, crisis (i.e., 50 percent more messages per unit of time and 75 percent larger messages), and war (i.e., 100 percent more messages per unit of time and 125 percent larger messages). Speed of service requirements for message delivery should be met even in the event of failures or anomalies (e.g. DMS component or network failure).

1.4.4 Supported User Platforms

The DMS program will field products which support the user platform combinations identified in **Appendix A.** Where POSIX is identified, DMS products should support multiple operating systems (e.g., HP/UX, Interactive UNIX, SCO UNIX, Solaris, and Windows NT).

1.4.5 Infrastructure Platforms

The DMS program will field necessary network infrastructure hardware and Portable Operating System Interface for Computer Environments (POSIX)-compliant software to enter, manipulate, process, view, store, retrieve and print the information required to support DMS-GOSIP infrastructure products. The hardware products will be equipped with devices to prevent unauthorized access and have controlled user access (via software or hardware).

1.4.6 System Description

The overall system description, component description, and a description of network connectivity is provided in **Appendix A.**

1.5 User Operations

The user and infrastructure components provide a user friendly, secure, accountable, and reliable messaging capability to satisfy validated DMS requirements for organizational and individual messaging service. Each authorized DMS user will be issued a Personal Computer Memory Card International Association (PCMCIA) card containing his/her messaging privileges, and security information required to exercise these privileges. The user then must insert the card into a DMS-Compliant PC or Workstation having access to the DMS Infrastructure (regardless of location), authenticate himself/herself to the workstation with a personal identification number, and use the messaging privileges authorized by his/her PCMCIA card.

A DMS messaging user with individual messaging privileges will

have the capability to draft, release, transmit and receive individual messages to/from other DMS individual or organizational users worldwide. ***As a minimum, all Corps employees that have a PC and currently use E-mail will be given this privilege***.

Depending on privileges, a DMS organizational messaging user may read organizational messages as an addressee, draft organizational messages and transmit for subsequent coordination and release, and sign (release) organizational messages within organizational, classification, and precedence privileges, and manage administration of such privileges.

Other than use of the PCMCIA card as described above, DMS Infrastructure service and security protection will be transparent to message writers and readers. DMS messaging will in most circumstances be integral to office automation systems (OAS), requiring no special expertise beyond that required to effectively use the OAS.

USACE DMS-GOSIP

Section II

Resourcing and Schedules

2.1 Resources

2.1.1 Project Resources

The Commander, U.S. Army Information Systems Command Deputy Chief of Staff for Systems Development (USAISC DCSSD) exercises primary staff responsibility for this program. In accordance with (IAW) the Information System Mission Order (ISMO), ISMO B92M00592, 15 April 92, the Commander, USAISC has designated the Defense Message System Management Office/Provisional (DMS MO/P) as the sole management activity responsible for administering project resources to include distribution of resources among participating organizations, as well as requesting resources from USAISC as required.

2.1.1.1 Resource Requirements

USAISC will provide the DMS MO/P and subordinate commands with program guidance and budgeting instructions for all resources not presently available to implement the project, and will establish the resource baseline. Participating agencies and commands will provide the DMS Management Office/Provisional, ATTN: ASQM-DMS, with estimates of the resources required for the implementation and execution of the project, with data update versions as required. Implementation of the Army DMS-GOSIP Program within USACE will be accomplished within existing manpower resource ceilings.

Defense Information System Agency (DISA), the DoD DMS PM and USAISC will pay acquisition costs for all major infrastructure hardware and software.

USAISC DCSSD is responsible for requesting and defending resources for the development, deployment, operation, logistics support and modification of Army DMS-GOSIP installations. USAISC DCSSD is also responsible for the input to the Planning, Programming and Budget Execution System (PPBES).

2.1.1.2 Resource Categories

Requirements will be programmed by participating organizations

and identified through the Commander, USAISC. Required resources, including Temporary Duty (TDY), will be programmed for each fiscal year by category of funds; i.e., Operation and Maintenance, Army (OMA) and Other Procurement, Army (OPA). Resources will be programmed for the following functional categories:

a. Management
b. Integrated Logistics Support (ILS)
c. Communications Engineering
d. Equipment Acquisition/Procurement
e. Site Preparation
f. Installation/Integration
g. Training
h. Test and Evaluation
i. Transition to O&M.

Commands (Users), will have to program dollars to procure their portion of the DMS system. The User must buy the User Agent Software (resides on user owned/procured workstations), and MISSI Products (Fortezza personal Computer Memory Card International Association (PCMCIA) Cards and PCMCIA Card Reader. ***However, to jump start the DMS implementation, the Army DMS PMO has agreed to fund for the first 11 percent of the user components, with MACOMs responsible for funding the remaining 89 percent.***

USACE CEIM-P has submitted funding requirements in the DA INFOSEC Requirements Program, DA POM and the Research, Development and Acquisition Plan Budget estimate Submission to HQDA for the DMS **User Agent** components that the MACOMs are responsible for funding. See **Appendix B**, USACE DMS Individual User Component Requirements, for user components and funding requirements.

USACE activities are still responsible to fund for any personal computer replacements (to include the PCMCIA card reader).

2.2 User Resources

The acquisition of DMS-GOSIP hardware and software for the DMS-Army Program, to include **first** two year's Contract Logistic Support (CLS), will be accomplished by the DoD DMS PMO through authorized contract vehicles. Funding for support each year after this initial support will be the responsibility of the O&M Command (User).

Some Corps activities may desire to purchase the non-certified version of the User Agent software ahead of the Army DMS PMO to become familiar with its messaging features (see description in

Appendix A). This is permissible. However, early purchases of the User Agent software prior to DMS compatibility certification will require a swap later on for the certified version. Those activities desiring to make an early purchase must submit their requirements to CEIM-P, with funding documentation (MIPR), for onward submission to the Army DMS PMO. The Army DMS PMO will order the User Agent from the DMS contract.

Note - *The three software providers under the Loral contract are Enterprise Solutions Ltd. (ESL), Lotus Development Corp., and Microsoft Corp, that will provide the user agent, or client, software and subordinate message transfer agents. These provide the ability to create, send and receive messages and to access the X.500 directory services. ESL's Enterprise Extended Mail suite of products, Lotus Notes DMS, which integrates a cc:Mail interface and Lotus Notes Release 4 features, and Microsoft Exchange, which integrates messaging and groupware features will all be available after DMS compliance certification. The two groupware products on the contract - Lotus Notes DMS and Microsoft Exchange - are something users will see more of in the government.*

Vendors not on the DMS contract, such as Banyan Systems Inc., and Novell, plan to get their messaging products DMS-certified and sell them through the GSA schedule.

2.3 Schedules

2.3.1 General

Based on tasking from HQDA, CEIM-P has prepared and submitted to the Army DMS PMO, a chart **(Appendix C)** identifying all USACE activities, those that operate TCCs, the number of AUTODIN/E-mail users in each activity, and funding requirements for the 11% fielding of User Agents that the Army DMS PMO has promised to buy and the 89% fielding that USACE is responsible for buying. This chart also identifies the Corps' proposed prioritized DMS-GOSIP implementation schedule. The Generic site implementation milestones for any given site are at **Appendix D**.

2.3.2 Responsibilities

The Army DMS PMO is responsible for the development and maintenance of schedules and milestone charts for Army DMS-GOSIP installation locations. As Corps sites must be integrated into the Army master DMS-GOSIP implementation schedules, the Corps' proposed implementation schedule could change. Amended site

implementation schedules will be published when available.

The initial goal is to have three or four Corps sites participate in the Army DMS Beta testing. These sites would utilize DMS products provided by the Army DMS PMO and where possible, the User Agent messaging software would be DMS certified versions of mail software that the sites are familiar with.

USACE DMS-GOSIP

Section III

Project Management Control

3.1 General

USAISC will provide overall program guidance and control for the DMS-Army Program. The DMS Management Office/Provisional (MO/P) has been designated as the central management authority for the DMS-Army Program.

3.2 Principal Management Activities

DMS Program/project management responsibilities for the Corps rest with:

- ***Headquarters, U.S. Army Corps of Engineers Information Management Directorate (CEIM-P)***

DMS technical implementation responsibilities for the Corps rest with:

- ***U.S. Army Corps of Engineers Electronic Mail Mandatory Center of Expertise (CENPD-IM-M)***

Appendix A

System Description

Introduction

The Defense Message System (DMS) will provide an improved message system that satisfies writer-to-reader requirements.

Purpose

The purpose of this appendix is to provide a brief System Description for Army DMS-GOSIP target architecture.

Scope

Wherever reliable secure messaging services are required, the DMS will provide those services. The operating areas for the DMS users include sustaining base, tactical, mobile, special requirements, and traveling environments. These environments include a multitude of different communications and messaging infrastructures of varying sizes.

General System Description

The DMS is an implementation of the DMS message handling system, directory, security, and management components at various Service and Agency locations. It provides the capability of messaging from writer-to-reader using Commercial Off The Shelf (COTS) products to implement X.400 and X.500 and security for Military Message formats. The initial fielding will be for sensitive but unclassified traffic only, which will be carried over a network of Internet Protocol Routers and Integrated Digital Network Exchange multiplexers.

Messaging Classes

The mission of the DMS is to handle every message in a manner appropriate to its content. The term "message" is defined in ACP 167, "Glossary of Communications - Electronics Terms", to be "any thought or idea expressed briefly in plain or secret language, prepared in a form suitable for transmission by any means of communications". In the DMS context, the means of communications is restricted to common-user electronic methods. In order to handle every message in a manner appropriate to its content, two message classes are currently identified for inclusion in the DMS; however as the system and its underlying technology evolve, additional messaging service classes may be required.

a. Organizational: This class includes command and control messages and communications exchanged between organizational elements. These messages require approval for transmission by designated officials of the sending organization and determination of internal distribution by the receiving organization. Because of their official and sometimes critical nature, such messages impose operational requirements on the communications systems for capabilities such as non-routine precedence, guaranteed timely delivery, high availability and reliability, and a specified level of survivability and security.

b. Individual: This class includes working communications between individual DoD personnel within administrative channels, both internal and external to the specific organizational element. Such messages do not generally commit or direct an organization. Messages requiring only a basic transport service will be treated as a part of this class. The driving requirements on the communications system for this class of messages are connectivity down to the user level and ease of use.

DMS Operational Requirements

The specific requirements for the DMS are quoted from the draft Multi-command Required Operational Capability (MROC) 3-88. The requirements are stated from the perspective of writers and readers, independent of specific implementations to allow the flexibility for multiple solutions and satisfaction of Service/agency unique applications.

a. Connectivity/Interoperability.

(1) The DMS should allow a user to communicate with any other user DMS community. The community of users includes organizations and the Department of Defense. In addition the DMS must support systems of other government agencies, allies, tactical and defense contractors. System users may be fixed, mobile or transportable.

(2) Connectivity must extend from writer to reader. Messages should be composed, accepted for delivery, and delivered as close to the user as is practical. Current efforts, such as extension of automation to users and improved base level message distribution systems, are responsive to this requirement.

(3) The DMS must be interoperable with and provide standard interfaces to tactical and allied systems. It should lead DoD's migration to international standards and protocols.

b. Guaranteed Delivery/Accountability.

(1) The DMS must, with a high degree of certainty, deliver a message to the intended recipient(s). If the system cannot deliver a message, a method of promptly notifying the sender of the non-delivery must be available.

(2) For organizational message traffic, the DMS must have the capability to maintain writer-to-reader message accountability.

c. Timely Delivery. The DMS must recognize messages that require preferential handling. The urgency of the most critical information requires handling above and beyond simple priority. The DMS must dynamically adjust to traffic loads and conditions to provide timely delivery of critical information during peacetime, crisis, and war. Delivery time for a given message will be a function of message precedence and system stress level.

d. Confidentiality/Security. Confidentiality precludes access to or release of information to unauthorized recipients. The DMS must process and protect all unclassified, classified and other sensitive message traffic at all levels and compartments. The DMS must maintain separation of messages within user communities to satisfy confidentiality. Security is based upon requirements for integrity and authentication as well as confidentiality.

e. Sender Authentication. The DMS must unambiguously verify that information marked as having originated at a given source did in fact originate there. For organizational traffic, a message must be approved by competent authority before transmission.

f. Integrity. Information received must be the same as information sent. If authorized by the writer, the DMS may make minimal format changes to accommodate differences in capabilities between the component systems serving the writer and the reader. However, the DMS must ensure that information content of a message is not changed.

g. Survivability. The DMS must provide a service as survivable as the users it serves. It must not degrade the survivability of systems interfaced to it. Methods such as redundancy, proliferation of system assets, and distributed processing may be employed. Surviving segments of DMS must be capable of reconstitution.

h. Availability/Reliability. The DMS must provide users

with message service on an essentially continuous basis. The required availability of the DMS should be achieved by a combination of highly reliable and readily maintainable components, thoroughly tested software, and necessary operational procedures.

i. Ease of Use. The DMS must be flexible and responsive enough to allow user operation without extensive training. Use of the DMS should not require the knowledge of a communications specialist.

j. Identification of Recipients. The sender must be able to unambiguously identify to the DMS the intended recipient organizations or individuals. The necessary directories and their authenticity are part of the DMS.

k. Message Preparation Support. The DMS must support user-friendly preparation of messages for transmission, to include services such as U.S. Message Text Format (USMTF) assistance.

l. Storage and Retrieval Support. The DMS must support storing messages after delivery to allow retrieval for such purposes as readdressal, retransmission, and automated message handling functions such as archiving and analysis, with the capability of incorporating segments into future messages. The minimum storage period for organizational messages will be specified by Allied Communications Procedures.

m. Distribution Determination and Delivery.

(1) For organizational message traffic, the DMS must determine the destination(s) of each message (in addition to the addressee(s) specified by the originator) and effect delivery in accordance with the requirements of the recipient organization.

(2) For individual message traffic, the DMS must effect delivery of each message to the individual(s) specified by the originator.

Defense Message System Components

Brief Descriptions of the major messaging components of the DMS are given in the following sections.

DMS Software Components

User Agent (UA)

The UA software provides access to an e-mail account and allows the preparation, storage, and display of messages. The UA provides for submission of messages to the Message Transfer System (MTS).

The DMS UA is the user component of the message handling system. The DMS UA is based upon the International Telephone and Telegraph Consultative Committee (CCITT) - defined X.400 UA elements of service (EoS) and incorporates optional X.400 EoSs as mandatory for DMS service. It must interface with the DMS Message Handling System (MHS) on behalf of a single DMS individual or organizational writer or reader. The DMS UA is required to provided a P772/P48 interface to an MTA and an MS as defined in Allied Communications Publication 123 and the DoD Standardized Profiles (DSPs). The DMS UA also is required to employ graphical user interface (GUI) technology, in accordance with the DoD Technical Reference Model, to provide an easy to use interface for the writer and reader. To provide the user with multifunctional support, the DMS UA software application will reside in various workstation configurations (e.g., a Disk Operating System (DOS) - based Personal Computer (PC) or server) along with other applications, such as word processing, spreadsheet, and file transfer. The DMS UA is required to prepare message receipt notifications on command. The DMS UA must also store messages and maintain writer-to-reader accountability. Moreover, the DMS UA is required to be configurable; that is, specialized functions, such as automated distribution determination and treatment of high-precedence messages, may be implemented optionally in a DMS UA. DMS UA requirements also include the following:

- Interact directly with the DMS writer or reader to provide all message preparation, submission, delivery, foldering, archiving, printing, and profiling.

- Access the DMS DUA and MS services, described below, and those elements of service defined for each message content type (i.e., P772 and P48).

- Support both text and binary body parts.

- Provide and support the DMS message release authority function, which is the approval of organizational messages prepared locally or by other subordinate DMS UAs.

Interface with and support automated distribution determination and submission of delivered organizational messages for subordinate DMS UAs.

Guarantee delivery of selected messages and support receipt of high-precedence or classified messages at any time, day or night.

Message Transfer Agent (MTA)

The MTA provides a store and forward transmission of messages from an originator to the intended recipients. It provides mail host services to local users and message switching services for the backbone X.400 messaging network.

Mail List Agent (MLA)

The MLA is used to simplify the distribution of single messages to multiple recipients. Messages may contain the address of a mail list (ML) which needs to be expanded by the MLA. The MLA receives messages, interfaces to the DMS X.500 Directory for information to expand MLs, obtain access control information on the ML, and obtain X.509 certificates for the appropriate ML members. It then regenerates the original message with the appropriate members as recipients. Like the UA, the MLA uses a cryptographic card called FORTEZZA to protect messages and provide security services.

Message Store (MS)

The MS provides the capability for messages to be delivered and stored at a location separate from the users personal computer. It is analogous to a Post Office Box for letters. Messages can be saved, printed and archived on the MS. It may be implemented between the UA and the MTA to act as a storage device for messages. The MS can be a stand alone device or be collocated with an MTA.

Multi-Function Interpreter (MFI)

The MFI is a multi purpose Interpreter that allows the user to transmit and receive messages between messaging domains by translating between different messaging and security formats. The major messaging domains for which the MFI provides message format conversion are; X.400, AUTODIN, and Simple Mail Transfer Protocol (SMTP).

Directory System Agent (DSA)

The DSA provides a DMS X.500 compliant directory service. It contains information necessary to identify, compose, encrypt and address messages.

The DSA incorporates the DMS Unclassified Directory Schema, resolves user or application requests, maintains a distributed environment of local and remote directory data bases, and supports the ADUA/DUA in either a local or distributed environment.

The DSA complies with the following security requirements:

- a configurable capability to generate audit logs for problem analysis and security analysis, as required by ACP 123, and the DMS Security Policy
- strong authentication between associated DMS components, using the MISSI Product digital signature capability
- certificate retrieval and authentication
- authorization profiles for each DMS user

Certification Authority Workstation (CAW)

The Multilevel Information System Security Initiative (MISSI) Certificate Authority Workstation is an infrastructure element responsible for the management of the cryptographic devices and security information. The CAW is the cornerstone supporting the subsystem of the MISSI architecture which manages cards, keys, certificates, user privileges, authorizations, and security parameters. The CAW supports both classified and unclassified applications, as well as other infrastructure elements. The CAW performs distributed directory and security management tasks. It initializes Fortezza cards with a Personal Identification Number, X.509 certificate and selected DMS information.

Operation of the CAW requires a dedicated individual with appropriate security clearances and the experience of a cryptographic type operation.

Management Work Station (MWS)

The MWS provides automated message service management. Each MWS product will allow remote monitoring and control of all DMS products, supporting configuration, fault, performance, security

management, and accounting for system monitoring and control, system administration, and customer service.

The MWS will comply with the following security requirements:

- a configurable capability to generate audit logs for problem analysis and security analysis, as required by ACP 123, and the DMS Security Policy
- strong authentication between associated DMS components, using the MISSI Product digital signature capability
- certificate retrieval and authentication
- authorization profiles for each DMS user

Profiling User Agent (PUA)

The PUA is a specialized UA that automatically determines distribution for messages. It does this by looking at the recipient and subject matter information in the message, and comparing that information to profile lists and then determines distribution accordingly.

Each PUA product shall have the capability to verify the integrity and originator of every signed and/or encrypted message received, and to re-verify the integrity of archived messages via the integrated MISSI products.

Administrative Directory User Agent (ADUA)

The ADUA is a DMS compliant DUA application program that provides directory administrators with capabilities to modify, add, and delete DMS X.500 Directory entries. It will possess Industry/Government Open Systems Specification (IGOSS) administrative capability to interact with the DSA to manage/administer the Directory data structure and content.

Directory User Agent (DUA)

The DUA is an application program that assists the user in accessing the X.500 directory. It can be either a stand-alone application, or integrated with the UA. The DUA may be built into or used in conjunction with other products. The DUA product will have the capability for searching, browsing, or looking up information from the directory.

DMS Subsystems

The DMS provides the software and components to build the Defense Message System which is composed of four sub systems: Message Handling System (MTA, MS, UA, PUA, MLA, and MFI), Directory System (DSA, DUA and ADUA), Management System (MWS), and Security System (MISSI Products integrated into the DMS GOSIP components).

DMS Component Capability

The number of users that each Army DMS component will support is listed below:

BMTA	30,000 users
IMTA	200-250 organizational users
SMTA	200-250 individual users
DSA	5,000 users
MFI	5,000 users
CAW	500 users
MLA	2,500 users
MWS	one required for every active MTA, DSA
MS	200-250 users
UA	One required for every user
PUA	1,250 users
ADUA	One required for every active MWS, DSA, CAW

DMS Hardware Components

The hardware requirements for the Army DMS Target Architecture are many and varied. The target architecture is a compilation of many components which, when working together, provide the DMS X.400 Message Handling System. Most of the Army DMS services will be provided by software components or applications and will be used on pre-existing personal computer (PC) hardware.

From a message flow perspective, each hardware piece or suite will be described. The message flow starts with the user preparing either individual or organizational Unclassified but Sensitive Army DMS messages, and continues on through the system

until the message is received at the distant station.

User Agent (UA)

The minimum (generic) IBM Personal Computer hardware requirements needed for a PC to run the UA software are:

- 80386 25 MHz processor (or better)
- 4 (or more) megabyte (MB) Random Access Memory (RAM)
- 20 MB hard drive space dedicated to DMS program (not data) software
- (3 1/2") floppy disk drive
- VGA color monitor
- Standard (110-key) keyboard with mouse
- Personal Computer Memory Card International Association (PCMCIA) card reader
- PCMCIA/Fortezza card

a. The PCMCIA, a non-profit trade association, was founded in 1989. The PCMCIA defined a bus technology that standardized credit card-sized adapters called PCMCIA cards. PCMCIA cards are computer expansion cards in the form of removable modules; that can hold memory, modems, facsimile (FAX)/modems, radio transceivers, network adapters, solid state disks or hard disk, and multimedia sound cards. The PCMCIA standards establish the slot size, the physical interface, the type of device, the data format, and included software. All PCMCIA cards are 3.37 inches long by 2.126 inches wide (85.6mm by 54mm) and use a 68-pin connector; but differ in thickness. The DMS will initially use the Type II PCMCIA card, which is 0.13 inches thick (5.0mm). The Type II PCMCIA cards are used for input/output (I/O) devices. The system can be connected to networks by using cards for I/O such as FAX modems, Ethernet adapters, LAN connectors and wireless network adapters.

b. The PCMCIA/Fortezza Cryptographic card, when used in conjunction with MISSI Release 1 (MR1), provides each authorized user writer-to-reader security services that provide confidential data, originator authentication, and data integrity. The card employs a single chip micro controller type design. It contains a limited amount of processing resources with classified

applications in firmware related to the various cryptographic algorithms and key management functions. The card has a single thread or path execution of chained commands sent by the user application. Card functions and algorithms related to encryption, decryption, sign-on and verification will be employed while performing the user identification, association and authentication, and data confidentiality functions.

PCMCIA Card Reader

The PCMCIA card reader allows the use of the Fortezza card for identification and authentication of DMS users. The PCMCIA card reader is able to read Type I, II, or III PCMCIA cards. The Army DMS will initially use Type II PCMCIA cards to support the Fortezza utilities. PCMCIA card readers require the following system specifications to be utilized:

- 80386 or 486 IBM AT or compatible
- One 16-bit AT-bus slot, or Small Computer System Interface (SCSI) interface card
- 1/2" floppy disk drive
- Hard disk (no minimum requirement)
- 1/4" half-height drive bay slot
- MS-DOS 5.0 or better/or UNIX OS/or WINDOWS OT
- Keyboard/mouse

Message Store (MS)

The hardware requirements for the MS software are determined by the level of the MTA or UA where the MS is located, as well as whether or not the MS is collocated with other DMS components that reside on the same hardware platform.

a. MTA level - MS software that is collocated on the same platform as the MTA software uses the hardware specifications of the MTA.

b. UA level - MS software that is collocated on the same platform as the UA uses the hardware specifications of the UA.

c. Separate platform - MS software residing on a platform separate from either a UA, MTA, or other DMS component, requires

the following hardware:

- 486 50 MHz processor (or better)
- 16 MB (or more) RAM
- 1 GB hard drive (240 MB if operating at UA level)
- Floppy disk drives
- VGA color monitor
- Standard keyboard with mouse
- PCMCIA card reader

Mail List Agent (MLA)

The MLA is basically a software component however, it may be located on a separate hardware component. The hardware required is the standard hardware configuration when co-resident with the MTA, or UA software. When separated from the MTA or UA, the hardware required is that of a standard PC (386 or 486, 50 MHz, 8 MB RAM) plus a sufficient amount of storage (240 MB or more) to enable MLA processing.

Message Transfer Agent (MTA)

Some of the components being considered are:

a. Hewlett-Packard 9000 (HP 9000) Model 750. The HP 9000 Model 750 workstation provides high performance, expendability, and large RAM with optional storage capacity. The Model 750 has a 66 MHz PA-RISC processor with integrated 66 MHz floating point coprocessor. The Model 750 comes with a 19-inch 1280x1024 72 Hz color monitor.

b. SUN Microsystems SPARC Model 5 (SUN SPARC5). The SUN SPARC5 workstation provides high performance, expandability, and large RAM with optional storage capacity. The SUN SPARC5 has a 40 MHz processor. The SUN SPARC5 comes with a 17-inch color monitor.

c. Motorola 68020+. The Motorola 68020+ workstation provides high performance, expandability, and large RAM with optional storage capacity.

Network Connectivity

The DMS will initially be implemented for sensitive but unclassified traffic. Until the classified components are available, the DMS will be restricted to the NIPRNET.

The DMS can be configured to use the full GOSIP protocol stack (which includes the OSI connectionless network protocol (CLNP)) or the TCP/IP protocol stack. If a full GOSIP implementation is requested, the IP routers that are used must be configured to run CLNP and IP protocols simultaneously and will be referred to as multi-protocol routers. Not all routers are capable of running both protocols. For example, the Cisco AGS+ routers, the most common router in the IP network, must have a minimum of revision 9 software to run both protocol stacks. The router configuration file consists of the IP addresses and the CLNP addresses resulting in increased management responsibility.

The DMS MTS consists of a series of Integrated Digital Network Exchange (IDNX) multiplexers connected to each other. Attached to these IDNXs will be a group of high speed Internet Protocol (IP) routers called NIPRNET routers. These routers will be controlled and maintained by DISA. Attached to the NIPRNET routers will be the Army IP Routers. These routers will be controlled and maintained by the Service and Agencies. Also included within the DMS MTS backbone are the BMTAs. These four components (IDNXs, NIPRNET routers, Army routers and BMTAs), constitute the backbone level of the DMS MTS.

Topology

This section contains a description of the abstract DMS topology and the physical topology of Army DMS-GOSIP X.400 components.

DMS Topology

The Army DMS GOSIP System provides seamless "writer-to-reader" messaging service to all users, regardless of the service level or site size, wherever the user is located. The text below provides a brief description of the topology.

DMS Service Center (DMS SC)

The DMS SC is representative of a large site or regional center. However, not all locations designated as DMS SCs or large sites will have the full suite of backbone components (IDNX, NIPRNET router, Army router and BMTA). Also located at the DMS SC are the regional components of the DMS, such as the MFI, the MLA, and the DSA. These major components provide messaging services to users at medium, small, remote or tactical sites. Army routers

provide connectivity to other DMS sites.

Area Support Group (ASG)

This level is representative of a medium site. The IMTAs provide messaging service for organizational users, the SMTAs provide messaging service to individual users. The major components at this site would also provide messaging services to users at small or remote sites. Army routers provide connectivity to other DMS sites.

Local Support Group (LSG)

The LSG is representative of a small site. The SMTAs provide individual messaging services to users at this site, and users at remote sites. Organizational messages would be routed to an IMTA located at a larger site. Army routers provide connectivity to other DMS sites.

Small Support Group (SSG)

The SSG is representative of a remote site. Terminal Servers (TSs) would provide access to Army Routers. Army routers provide access to the major messaging components and services located at larger DMS sites.

Appendix B

USACE DMS Individual User Component Requirement

This chart shows the types of User Agents that the Corps is responsible for funding, the quantity of each and total cost. These total costs will be reduced by the 11% that the Army DMS PMO has agreed to buy. CEIM-P has submitted programming documents for the funds to procure these items. The user however, is responsible for purchasing of required Personal Computer equipment to support the DMS.

	Unit Cost	FY96	FY97	FY98	FY99	FY00	FY01	Total
User Agents	Rqd $100	3204 $320,400	7463 $746,320	7463 $746,320	7463 $746,320	7463 $746,320	7463 $746,320	40,519 $4,052,000
Fortezza	Rqd $98	3204 313,992	7463 $731,374	7463 $731,374	7463 $731,374	7463 $731,374	7463 $731,374	40,519 $3,970,862
Fortezza +	Rqd $250	230 $57,500	175 $43,750	145 $36,250	155 $38,750	160 $40,000	165 $41,250	1030 $257,500
PC Reader	Rqd $150	3435 $515,250	6500 $975,000	6500 $975,000	6500 $975,000	6500 $975,000	6500 $975,000	35,935 $5,390,250
Totals	- - - - -	$1,207,142	$2,496,444	$2,448,944	$2,491,444	$2,492,694	$2,493,944	$13,670,612
OPA Funded								
Total Delta								
Total % Funded								

Appendix C

USACE DMS Funding Requirements and Site Implementation Sequence

This chart shows total funding requirements to purchase DMS User Agents (11% will be fielded by the Army DMS PMO, 89% to be fielded by USACE), and the prioritized implementation schedule.

Installation	St	ISL	DMS	ASIP	Tot UAs	11% Field	Cost (11%)	Increment (11%)	89% Field	Cost (89%)	USACE Activity Name
Wash, DC (Pulaski Bld)	DC	N/A	1	* *	1500	165	$57,420.00	$57,420.00	1335	$425,881	HQUSACE
Portland	OR	N/A	2	* *	395	43	$14,964.00	$72,384.00	352	$112,292	North Pacific Division
Ft. Shafter	HI	N/A	3		577	63	$21,924.00	$94,308.00	514	$163,972	Pacific Ocean Division
Seoul	KO	N/A	4		203	22	$7,656.00	$101,964.00	181	$57,741	Far East District
Cp Zama	JA	N/A	5		307	34	$11,832.00	$113,796.00	273	$87,090	Japan District
Huntsville	AL	N/A	6		585	64	$22,272.00	$136,068.00	521	$166,205	Huntsville Division
Frankfurt	GE	N/A	7		317	35	$12,180.00	$148,248.00	282	$89,961	Europe District
Vicksburg	MS	N/A	8		1593	175	$60,900.00	$209,148.00	1418	$452,359	Waterways Experiment Station
Ft. Belvoir	VA	N/A	9		439	48	$16,704.00	$225,852.00	391	$124,734	Topographic Engineering Lab
Winchester	VA	N/A	10		476	52	$18,096.00	$243,948.00	424	$135,261	TransAtlantic Division
Vicksburg	MS	N/A	11	* *	1449	159	$55,332.00	$299,280.00	1290	$411,525	Vicksburg District
Memphis	TN	N/A	12	* *	612	67	$23,316.00	$322,596.00	545	$173,862	Memphis District
Omaha	NE	N/A	13		263	29	$10,092.00	$332,688.00	234	$74,649	Missouri River Division
Omaha	NE	N/A	14	* *	1644	181	$62,988.00	$395,676.00	1463	$466,715	Omaha District
Atlanta	GA	N/A	15	* *	242	27	$9,396.00	$405,072.00	215	$68,588	South Atlantic Division
Mobile	AL	N/A	16	* *	1805	199	$69,252.00	$474,324.00	1606	$512,333	Mobile District
New York	NY	N/A	17		164	18	$6,264.00	$480,588.00	146	$46,576	North Atlantic Division
New York	NY	N/A	18	* *	602	66	$22,968.00	$503,556.00	536	$170,990	New York District
Baltimore	MD	N/A	19	* *	1164	128	$44,544.00	$548,100.00	1036	$330,496	Baltimore District
Waltham	MA	N/A	20	* *	662	73	$25,404.00	$573,504.00	589	$187,898	New England Division
Elmendorf AFB	AK	N/A	21		440	48	$16,704.00	$590,208.00	392	$125,053	Alaska District
Louisville	KY	N/A	22	* *	1222	134	$46,632.00	$636,840.00	1088	$347,085	Louisville District
San Francisco	CA	N/A	23	* *	268	29	$10,092.00	$646,932.00	239	$76,244	South Pacific Division

Installation	St	ISL	DMS	ASIP	Tot UAs	11% Field	Cost (11%)	Increment (11%)	89% Field	Cost (89%)	USACE Activity Name
Sacramento	CA	N/A	24	* *	1099	121	$42,108.00	$689,040.00	978	$311,994	Sacramento District
Dallas	TX	N/A	25		190	21	$7,308.00	$696,348.00	169	$53,913	Southwestern Division
Ft Worth	TX	N/A	26	* *	1255	138	$48,024.00	$744,372.00	1117	$356,336	Ft Worth District
Little Rock	AR	N/A	27	* *	908	100	$34,800.00	$779,172.00	808	$257,762	Little Rock District
Tulsa	OK	N/A	28	* *	1280	141	$49,068.00	$828,240.00	1139	$363,355	Tulsa District
Hanover	NH	N/A	29	* *	363	40	$13,920.00	$842,160.00	323	$103,041	Cold Regions Research & Engr Lab
Ft. Belvoir	VA	N/A	30		183	20	$6,960.00	$849,120.00	163	$51,999	Water Resources Support Center
Ft. Belvoir	VA	N/A	31		302	33	$11,484.00	$860,604.00	269	$85,814	Center for Public Works
Vicksburg	MS	N/A	32		261	29	$10,092.00	$870,696.00	232	$74,011	Lower Miss Valley Division
Ft Belvoir	VA	N/A	33		244	27	$9,396.00	$880,092.00	217	$69,226	Humphreys Eng Ctr Spt Activity
Kansas City	MO	N/A	34	* *	1086	119	$41,412.00	$921,504.00	967	$308,485	Kansas City District
Philadelphia	PA	N/A	35	* *	552	61	$21,228.00	$942,732.00	491	$156,635	Philadelphia District
Champaign	IL	N/A	36	* *	467	51	$17,748.00	$960,480.00	416	$132,709	Construction Engr Research Lab
Pittsburgh	PA	N/A	37	* *	932	103	$35,844.00	$996,324.00	829	$264,461	Pittsburgh District
Seattle	WA	N/A	38		887	98	$34,104.00	$1,030,428.00	789	$251,700	Seattle District
Savannah	GA	N/A	39	* *	979	108	$37,584.00	$1,068,012.00	871	$277,859	Savannah District
Wilmington	NC	N/A	40	* *	469	52	$18,096.00	$1,086,108.00	417	$133,028	Wilmington District
Los Angeles	CA	N/A	41	* *	818	90	$31,320.00	$1,117,428.00	728	$232,241	Los Angeles District
Galveston	TX	N/A	42		410	45	$15,660.00	$1,133,088.00	365	$116,439	Galveston District
Jacksonville	FL	N/A	43	* *	761	84	$29,232.00	$1,162,320.00	677	$215,971	Jacksonville District
Chicago	IL	N/A	44	* *	148	16	$5,568.00	$1,167,888.00	132	$42,110	North Central Division
New Orleans	LA	N/A	45	* *	1324	146	$50,808.00	$1,218,696.00	1178	$375,796	New Orleans District
Detroit	MI	N/A	46	* *	643	71	$24,708.00	$1,243,404.00	572	$182,475	Detroit District
St Paul	MN	N/A	47	* *	774	85	$29,580.00	$1,272,984.00	689	$219,799	St Paul District
Buffalo	NY	N/A	48	* *	307	34	$11,832.00	$1,284,816.00	273	$87,090	Buffalo District
Cincinnati	OH	N/A	49	* *	262	29	$10,092.00	$1,294,908.00	233	$74,330	Ohio River Division
Charleston	SC	N/A	50	* *	181	20	$6,960.00	$1,301,868.00	161	$51,361	Charleston District
Nashville	TN	N/A	51	* *	870	96	$33,408.00	$1,335,276.00	774	$246,915	Nashville District
Norfolk	VA	N/A	52	* *	456	50	$17,400.00	$1,352,676.00	406	$129,519	Norfolk District
Walla Walla	WA	N/A	53		704	77	$26,796.00	$1,379,472.00	627	$200,021	Walla Walla District
Huntington	WV	N/A	54	* *	960	106	$36,888.00	$1,416,360.00	854	$272,436	Huntington District
St. Louis	MO	N/A	55		871	96	$33,408.00	$1,449,768.00	775	$247,234	St Louis District

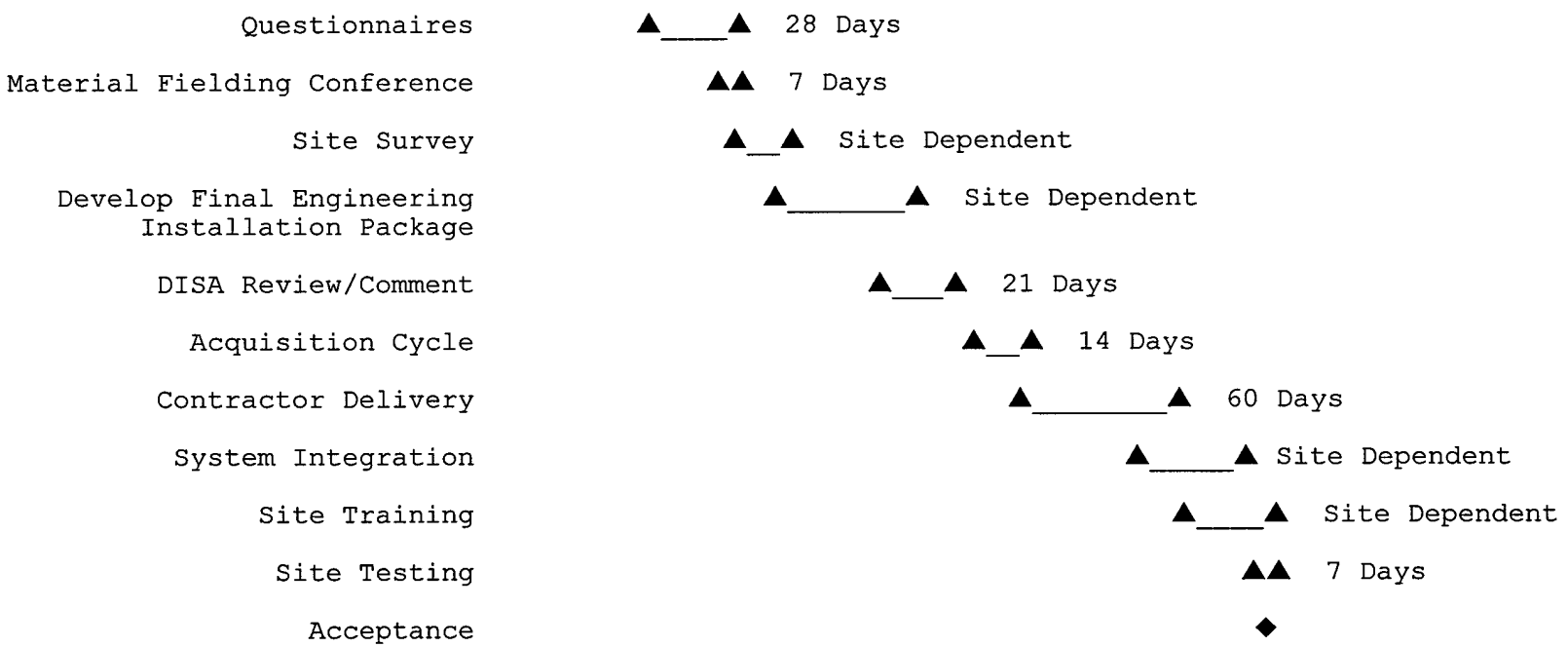
Installation	St	ISL	DMS	ASIP	Tot UAs	11% Field	Cost (11%)	Increment (11%)	89% Field	Cost (89%)	USACE Activity Name
Philadelphia	PA	N/A	56	* *	29	3	$1,044.00	$1,450,812.00	26	$8,294	Marine Design Center
Chicago	IL	N/A	57		197	22	$7,656.00	$1,458,468.00	175	$55,827	Chicago District
Rock Island	IL	N/A	58		869	96	$33,408.00	$1,491,876.00	773	$246,596	Rock Island District
San Francisco	CA	N/A	59		184	20	$6,960.00	$1,498,836.00	164	$52,318	San Francisco District
Portland	OR	N/A	60		1020	112	$38,976.00	$1,537,812.00	908	$289,663	Portland District
Albuquerque	NM	N/A	61	* *	345	38	$13,224.00	$1,551,036.00	307	$97,937	Albuquerque District
Totals					40519	4457	$1,551,036.00	$1,551,036.00	36062	$11,504,210.74	

Note ** = USACE TCC Locations

Appendix D

Site Implementation Schedule

This chart shows milestones for full DMS implementation at any given site



Appendix E

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Appendix F

List of Acronyms

ACP	Allied Communications Pamphlet
AMS	AUTODIN Mail Server
APPOC	Army Power Projection Operations Center
AUTODIN	Automatic Digital Network
BOM	Bill of Materials
C3I	Command, Control, Communications, and Intelligence
CAPR	Capability Requirement
CCITT	International Telephone and Telegraph Consultative Committee
CECOM	Communications-Electronics Command (Army)
CLIN	Contract Line Item Number
CLNP	Connectionless Network Protocol
CLNS	Connectionless Network Service
CLS	Contract Logistic Support
CMIP	Common Management Information Protocol
CONUS	Continental United States
DCS	Deputy Chief of Staff
DCSIM	Deputy Chief of Staff for Information Management
DIA	Defense Intelligence Agency
DIB	Directory Information Base
DISA	Defense Information Systems Agency
DMS	Defense Message System
DMSD	Defense Message System Directorate (USAISEC)
DMS MO/P	Defense Message System Management Office/Provisional
DoD	Department of Defense
DOIM	Director of Information Management
DOS	Disk Operating System
DSA	Directory Service Agent
DSP	DoD Standardized Profiles
DSS	Digital Signature Standard
DUA	Directory User Agent
EAC	Echelons above Corps

EA-TSS	Executive Agent - Tactical Switched Systems
EIP	Engineering Installation Package
EoS	Elements of Service
ES-IS	End System to Intermediate System Routing Protocol
GFE	Government Furnished Equipment
GNMP	Government Network Management Protocol
GOSIP	Government Open Systems Interconnect Protocol
GUI	Graphical User Interface
IAW	In Accordance With
IB0M	Installation Bill of Materials
IIP	Implementation/Installation Plan
IPS	Internet Protocol Suite
ISDP	Information Systems Design Plan
ISMO	Information Systems Mission Order
JANAP	Joint Army-Navy-Air Force Publication
JITC	Joint Interoperability Test Center
LAN	Local Area Network
MACOM	Major Command
MFC	Material Fielding Conference
MFI	Multi-Function Interpreter
MHS	Message Handling System
MISSI	Multi-Level Information Systems Security Initiatives
MLA	Mail List Agent
MLS	Multiple Level Security
MROC	Multicommand Required Operational Capability
MS	Message Store
MTA	Message Transfer Agent
MWS	Management Workstation
NSA	National Security Agency
O&M	Operations and Maintenance
O/R	Originator/Recipient
OAS	Office Automation Systems
OCONUS	Outside Continental United States
OMA	Operations and Maintenance - Army
OPA	Other Procurement - Army
OSD	Office of the Secretary of Defense
OSI	Open Systems Interconnect

PC	Personal Computer
PCM	Project Concurrence Memorandum
PCMCIA	Personal Computer Memory Card International Association
PLA	Plain Language Address
PM CHS	Project Manager, Common Hardware/Software
PMJTACS	Project Manager, Joint Tactical Communications Systems
PMO	Program Management Office
PMR	Project Management Review
POSIX	Portable Operating System Interface for Computer Environments
QA	Quality Assurance
QC	Quality Control
RDEC	Research and Development Engineering Center (CECOM)
ROMC	Required Operational Messaging Capabilities
SITREP	Situation Report
SMC	Small Multiuser Computer
SSC	Standard Systems Center (Air Force)
TAR	Technical Acceptance Recommendation
TDY	Temporary Duty
TOAD	Tobyhanna Army Depot
TPN	Tactical Packet Network
TCC	Telecommunications Center
UA	User Agent
USACE	U.S. Army Corps of Engineers
USAISC	U.S. Army Information Systems Command
USAISEC	U.S. Army Information Systems Engineering Center
USAISMA	U.S. Army Information Systems Management Activity